

New protein combination (Orf virus factors) accelerates wound healing with less scarring providing potential applications in burns (and other difficult wound scenarios).

Overview: The orf virus is a parapox virus, usually infecting sheep and goats in which it causes scabby mouth disease. Orf infections in humans cause severe skin lesions that, remarkably, heal without scarring. The research team at the Virus Research Unit (Department of Microbiology and Immunology, University of Otago) have discovered proteins in the orf virus that may be responsible for advanced healing.

Giant Orf of the nose (week 3)



Minimal scar (4 months)



Gurel et al., *European Journal of Dermatology*, 2002.

The first wound healing product to be developed is a locally applied combination of two orf proteins (expressed in mammalian cell lines): **Vascular Endothelial Growth Factor (VEGF-E)** and **interleukin 10 (IL-10)**.

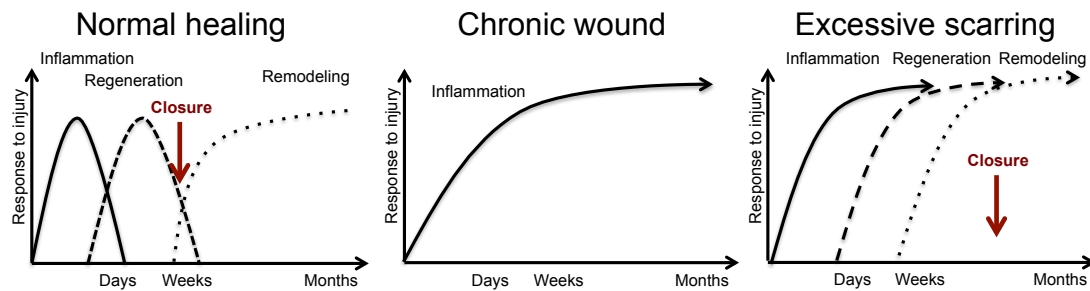
VEGF-E stimulates formation and growth of blood vessels without excess inflammation and oedema in tissue repair, while IL-10 is an additional anti-inflammatory, present in wound healing. Various research programmes investigating scarless healing in fetal development have shown that dampening of the inflammation phase without eliminating it altogether provides better healing outcomes.

Market need: Advanced wound healing with reduced scar formation has broad applicability including treatment of burns. Within the globally reported annual 160 million wounds, 9.8 million are burns. The WHO reports that non-lethal burns may require costly and prolonged hospitalisation and frequently result in disfigurement and disability, to which scarring is a significant contributing factor.

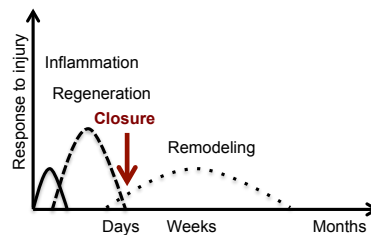


In the US, 450,000 burn related treatments are recorded of which 40,000 cases required hospitalisation. Average costs for those with burns of less than 20% of total body surface area are US\$47,875 compared to US\$432,746 for survivors of burns of greater than 90%. Keloids represent an exuberant wound healing response, an overgrowth of dense fibrous tissue that extends beyond the borders of the original wound. There is no effective treatment available beyond temporary improvements.

Otago's proposed solution: The protein combination of VEGF-E and IL-10 dampens the inflammatory phase whilst accelerating the body's own healing cycle to lead to faster and better tissue regeneration than without treatment. A major advantage in burns would be the prevention of excess tissue formation leading to less debilitating scars.



Ideal healing = rapid closure = scar free



Development status: Applying the combination of VEGF-E and IL-10 to full thickness puncture wounds *in vivo* (murine model) has provided promising results with regards to reduced inflammation and acceleration of the healing process. A faster completion of the regeneration phase produced all necessary, but less excess tissue, leading to high quality and less scarred tissue. These two proteins might be the essential factors that enable orf virus infections to heal with minimal scarring.

Next steps: The research team will test the VEGF-E and IL-10 combination on murine burn models and with successful results optimise dosage and formulation.

Intellectual Property: The intellectual property of the compound matter is protected within PCT application US 61/649,213.

Support: We are looking for collaborators and partners with expertise and relevant resources to guide further translation towards human proof of concept and into the market. What would you need to see from us in order to be interested in working with us?

For further information please contact:

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